

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently Amended) A radio apparatus characterized in that: a plurality of virtual terminal apparatuses ~~which are not present in reality and are not a terminal apparatus which is a real targeted communication party,~~ are assumed to be imaginarily present in respective predetermined directions which are different from a terminal apparatus which is a targeted communication party; an antenna's directional pattern is formed in accordance with a received response vector indicating a received response characteristic of a received signal from the terminal apparatus against a transmission signal and a virtual response vector being stored in advance, the received response vector and the virtual response vectors being used to form the antenna's directional pattern such that a signal strength in a first direction to the terminal apparatus becomes greater whereas a signal strength in a second direction to one of the virtual terminal apparatuses becomes smaller such that signal strength in one of the predetermined directions in which corresponding one virtual terminal apparatus is assumed to be imaginarily present is relatively small; and a signal is transmitted to the terminal apparatus which is the ~~[[real]]~~ targeted communication party such that the directional pattern is varied so as to prevent each of the plurality of virtual terminal apparatuses ~~assumed to be imaginarily present in the predetermined direction~~ from continuously receiving ~~[[a]]~~ the signal by changing from ~~said one of the second direction to a third direction to another one of the virtual terminal apparatuses at predetermined intervals~~ predetermined directions to another one direction.

2. (Currently Amended) A radio apparatus, including:

a computing unit which computes a received response vector of a terminal apparatus which is a targeted communication party, based on signals received from the targeted terminal apparatus, the received response vector indicating a received response characteristic of a received signal from the terminal apparatus against a transmission signal;

an acquiring unit which acquires one of virtual response vectors with respect to corresponding one of a plurality of virtual terminal apparatuses ~~assumed which are not present in reality and are not the terminal apparatus which is the targeted communication party, the plurality of virtual terminal apparatuses being assumed to be imaginarily present in respective predetermined directions, the virtual response vectors being stored in advance~~ such that the ~~predetermined~~ directions in which the plurality of virtual terminal apparatuses ~~are assumed to be present~~ exist are mutually different from each other, the virtual response vectors being stored in advance;

a generator which generates a transmission weight vector based on the received response vector computed by said computing unit and the one of the virtual response vectors ~~vector~~ acquired by said acquiring unit, the received response vector and the virtual response vectors being used to form the transmission weight vector indicting an antenna's directional pattern such that a signal strength in a direction to the terminal apparatus becomes greater whereas a signal strength in a direction to one of the virtual terminal apparatuses becomes smaller; and

a transmitter which transmits a predetermined signal to the targeted terminal apparatus based on the transmission weight vector generated by said generator,

wherein said acquiring unit acquires again, ~~as appropriate,~~ another virtual response vector such that one of the ~~predetermined directions~~ direction in which the one of the virtual terminal apparatuses ~~is assumed to be present~~ apparatus exists is changed to another direction, and the

thus reacquired virtual response vector is again subject to processes by said generator and said transmitter.

3. (Previously Presented) A radio apparatus according to Claim 2, wherein said acquiring unit reacquires, as appropriate, another virtual response vector whose value of correlation with the received response vector computed by said computing unit is less than or equal to a predetermined threshold value, and the thus reacquired virtual response vector is again subject to the processes by said generator and said transmitter.

4. (Currently Amended) A radio apparatus according to Claim 3, wherein said acquiring unit further includes:

a storage which stores the [[of]] virtual response vectors whose values of mutual correlation therewith are less than or equal to a predetermined threshold value; and

a selector which selects a virtual response vector from the virtual response vectors stored in said storage.

5. (Original) A radio apparatus according to Claim 3, further including:

a measuring unit which measures the intensity of a signal received from the targeted terminal apparatus; and

an intensity determining unit which instructs said acquiring unit to switch to the virtual response vector whose value of correlation with the received response vector computed by said computing unit becomes less than or equal to a predetermined threshold value if a signal strength value of the targeted terminal apparatus, which is calculated from the transmission weight vector, the received response vector and information on the intensity of the received signal measured by said measuring unit, is less than or equal to a threshold value.

6. (Previously Presented) A radio apparatus according to Claim 3, further including:
a measuring unit which measures the intensity of a signal received from the targeted terminal apparatus; and

an intensity determining unit which instructs said transmitter to increase the intensity of signals to be transmitted to the targeted terminal apparatus if a signal strength value of the targeted terminal apparatus, which is calculated from the transmission weight vector, the received response vector and information on the intensity of the received signal measured by said measuring unit, is less than or equal to a threshold value.

7. (Previously Presented) A radio apparatus according to Claim 5, wherein said intensity determining unit estimates the signal strength value of the targeted terminal apparatus from a value of correlation between the received response vector and the one of the virtual response vectors.

8. (Currently Amended) A transmission method characterized in that; a plurality of virtual terminal apparatuses ~~which are not present in reality and are not a terminal apparatus which is a real targeted communication party~~, are assumed ~~to be imaginarily present in respective predetermined directions~~ which are different from a terminal apparatus which is a targeted communication party; an antenna's directional pattern is formed in accordance with a received response vector indicating a received response characteristic of a received signal from the terminal apparatus against a transmission signal and a virtual response vector being stored in advance, the received response vector and the virtual response vectors being used to form the antenna's directional pattern such that a signal strength in a first direction to the terminal apparatus becomes greater whereas a signal strength in a second direction to one of the virtual terminal apparatuses becomes smaller ~~such that signal strength in the direction of one of the~~

~~predetermined directions in which corresponding one virtual terminal apparatus is assumed to be imaginarily present is relatively small; and a signal is transmitted to the terminal apparatus which is the [[real]] targeted communication party such that the directional pattern is varied so as to prevent each of the plurality of virtual terminal apparatuses assumed to be imaginarily present in the predetermined direction from continuously receiving [[a]] the signal by changing from said one of the second direction to a third direction to another one of the virtual terminal apparatuses at predetermined intervals predetermined directions to another one direction.~~

9. (Currently Amended) A transmission method ~~in which comprising: assuming that~~ a plurality of virtual terminal apparatuses ~~which are not present in reality and are not a terminal apparatus which is a real targeted communication party,~~ are assumed ~~imaginarily present in~~ respective predetermined directions which are different from a terminal apparatus which is a targeted communication party[:]), the method comprising: forming an antenna's directional pattern in accordance with a received response vector indicating a received response characteristic of a received signal from the terminal apparatus against a transmission signal and a virtual response vector being stored in advance, the received response vector and the virtual response vectors being used to form the antenna's directional pattern such that a signal strength in a first direction to the terminal apparatus becomes greater whereas a signal strength in a second direction to one of the virtual terminal apparatuses becomes smaller such that signal strength in one of the predetermined directions in which corresponding one virtual terminal apparatus is assumed to be imaginarily present is relatively small; and performing a control such that a value of the intensity of a signal received by the terminal apparatus which is the [[real]] targeted communication party is maintained, and such that relatively small signal intensity occurs in different directions other than the direction in which the terminal apparatus which is

the ~~[[real]]~~ targeted communication party exists, by changing from the second direction to a third direction to another one of the virtual terminal apparatuses at predetermined intervals ~~said one of the predetermined directions to another direction.~~

10. (Currently Amended) A transmission method in which ~~comprising; assuming that~~ a plurality of virtual terminal apparatuses ~~which are not present in reality and are not a terminal apparatus which is a real targeted communication party, are imaginarily present in respective predetermined directions; are assumed which are different from a terminal apparatus which is a targeted communication party, the method comprising;~~ generating a transmission weight vector necessary for weighting a predetermined signal used in transmitting ~~[[a]] the~~ predetermined signal to the terminal apparatus ~~which is the real targeted communication party,~~ from a received response vector of the targeted terminal apparatus and a first virtual response vector of one of the plurality of virtual terminal apparatuses, the received response vector indicating a received response characteristic of a received signal from the terminal apparatus against a transmission signal and virtual response vectors being stored in advance, the received response vector and the virtual response vectors being used to form an antenna's directional pattern such that a signal strength in a direction to the terminal apparatus becomes greater whereas a signal strength in a direction to a virtual terminal apparatus becomes smaller~~[[,]]; and performing a control in such a manner that the first virtual response vector is changed, as appropriate, to a second virtual response vector having a different value from that of the first virtual response vector so as to change from one of the direction predetermined directions in which the virtual terminal apparatus is assumed to exist~~ ~~apparatuses are assumed to be imaginarily present to another direction in which another virtual terminal apparatus is assumed to exist.~~

11. (Currently Amended) A transmission method, including:

computing a received response vector of a terminal apparatus which is a targeted communication party, based on signals received from the targeted terminal apparatus, the received response vector indicating a received response characteristic of a received signal from the terminal apparatus against a transmission signal;

acquiring one of virtual response vectors with respect to corresponding one of a plurality of virtual terminal apparatuses different from ~~which are not~~ the terminal apparatus which is a targeted communication party and, ~~the virtual terminal apparatuses which are not present in reality being assumed to be imaginarily present in predetermined directions, the virtual response vectors being stored in advance such that the predetermined directions in which the plurality of virtual terminal apparatuses are assumed to be present~~ exist are mutually different from each other, the virtual response vectors being stored in advance;

generating a transmission weight vector based on the received response vector computed in said computing and the virtual response vector acquired in said acquiring, the received response vector and the virtual response vectors being used to form the transmission weight vector indicting an antenna's directional pattern such that a signal strength in a direction to the terminal apparatus becomes greater whereas a signal strength in a direction to one of the virtual terminal apparatuses becomes smaller; and

transmitting a predetermined signal to the targeted terminal apparatus based on the transmission weight vector generated by said generating,

wherein said acquiring one of the virtual response vectors is such that another virtual response vector is acquired again, ~~as appropriate,~~ so as to change from ~~one of the~~ direction ~~predetermined directions in which the~~ ~~corresponding~~ one of virtual terminal apparatuses ~~apparatus is assumed to present~~ exists to another direction in which another virtual terminal

apparatus ~~is assumed to present~~ exists, and the thus reacquired virtual response vector is again subject to processes by said generating a transmission weight vector and said transmitting a predetermined signal.

12. (Previously Presented) A transmission method according to Claim 11, wherein said acquiring one of the virtual response vectors is such that a virtual response vector whose value of correlation with the received response vector computed by said computing is less than or equal to a predetermined threshold value is reacquired, as appropriate, and the thus reacquired virtual response vector is again subject to the processes by said generating a transmission weight vector and said transmitting a predetermined signal.

13. (Previously Presented) A transmission method according to Claim 12, wherein said acquiring one of the virtual response vectors further includes:

referring to a table storing the virtual response vectors whose values of mutual correlation therewith are less than or equal to a predetermined threshold value and selecting a virtual response vector from the virtual response vectors.

14. (Previously Presented) A transmission method according to Claim 12, further including:

measuring the intensity of a signal received from the targeted terminal apparatus; and
instructing said acquiring one of the virtual response vectors to switch to a virtual response vector whose value of correlation with the received response vector computed by said computing becomes less than or equal to a predetermined threshold value if a signal strength value of the targeted terminal apparatus, which is calculated from the transmission weight vector,

the received response vector and information on the intensity of the received signal measured by said measuring unit, is less than or equal to a threshold value.

15. (Original) A transmission method according to Claim 12, further including:
measuring the intensity of a signal received from the targeted terminal apparatus; and
instructing said transmitting a predetermined signal to increase the intensity of signals to be transmitted to the targeted terminal apparatus if a signal strength value of the targeted terminal apparatus, which is calculated from the transmission weight vector, the received response vector and information on the intensity of the received signal measured by said measuring unit, is less than or equal to a threshold value.

16. (Original) A transmission method according to Claim 14, wherein said instructing to switch to a virtual response vector is such that the signal strength value of the targeted terminal apparatus is estimated from a value of correlation between the received response vector and the virtual response vector.

17. (Previously Presented) A transmission method according to Claim 15, wherein said instructing to increase the intensity of signals is such that the signal strength value of the targeted terminal apparatus is estimated from a value of correlation between the received response vector and the one of the virtual response vectors.

18. (Currently Amended) A computer readable storage medium encoded with a program executable by a computer, the program including the functions of:

computing a received response vector of a terminal apparatus which is a targeted communication party, based on signals received from the targeted terminal apparatus, the

received response vector indicating a received response characteristic of a received signal from the terminal apparatus against a transmission signal;

acquiring one of virtual response vectors with respect to corresponding one of a plurality of virtual terminal apparatuses different from which are not the terminal apparatus which is a targeted communication party and, the virtual terminal apparatuses which are not present in reality being assumed to be imaginarily present in predetermined directions, the virtual response vectors being stored in advance such that the predetermined directions in which the plurality of virtual terminal apparatuses are assumed to be present exist are mutually different from each other, the virtual response vectors being stored in advance;

generating a transmission weight vector based on the received response vector computed in said computing and the virtual response vector acquired in said acquiring, the received response vector and the virtual response vectors being used to form the transmission weight vector indicting an antenna's directional pattern such that a signal strength in a direction to the terminal apparatus becomes greater whereas a signal strength in a direction to one of the virtual terminal apparatuses becomes smaller; and

transmitting a predetermined signal to the targeted terminal apparatus based on the transmission weight vector generated by said generating,

wherein said acquiring one of the virtual response vectors is such that another virtual response vector whose value of correlation with the received response vector computed by said computing is acquired again, ~~as appropriate~~ so as to change from ~~one of the~~ direction predetermined directions in which the corresponding one of virtual terminal apparatuses apparatus is assumed to be present exists to another direction in which another virtual terminal apparatus exists ~~is assumed to present~~, and the thus reacquired virtual response vector is again

subject to processes by said generating a transmission weight vector and said transmitting a predetermined signal.

19. (Previously Presented) A computer readable storage medium according to Claim 18, wherein said acquiring one of the virtual response vectors is such that a virtual response vector whose value of correlation with the received response vector computed by said computing is less than or equal to a predetermined threshold value is reacquired, as appropriate, and the thus reacquired virtual response vector is again subject to the processes by said generating a transmission weight vector and said transmitting a predetermined signal.

20. (Previously Presented) A computer readable storage medium according to Claim 19, wherein said acquiring one of the virtual response vectors further includes:

referring to a table storing the virtual response vectors whose values of mutual correlation therewith are less than or equal to a predetermined threshold value and selecting a virtual response vector from the virtual response vectors.

21. (Previously Presented) A computer readable storage medium according to Claim 19, further including: measuring the intensity of a signal received from the targeted terminal apparatus; and

instructing said acquiring one of the virtual response vectors to switch to a virtual response vector whose value of correlation with the received response vector computed by said computing becomes less than or equal to a predetermined threshold value if a signal strength value of the targeted terminal apparatus, which is calculated from the transmission weight vector, the received response vector and information on the intensity of the received signal measured by said measuring unit, is less than or equal to a threshold value.

22. (Previously Presented) A computer readable storage medium according to Claim 19, further including: measuring the intensity of a signal received from the targeted terminal apparatus; and

instructing said transmitting a predetermined signal to increase the intensity of signals to be transmitted to the targeted terminal apparatus if a signal strength value of the targeted terminal apparatus, which is calculated from the transmission weight vector, the received response vector and information on the intensity of the received signal measured by said measuring unit, is less than or equal to a threshold value.

23. (Previously Presented) A computer readable storage medium according to Claim 21, wherein said instructing to switch to a virtual response vector is such that the signal strength value of the targeted terminal apparatus is estimated from a value of correlation between the received response vector and the virtual response vector.

24. (Previously Presented) A computer readable storage medium according to Claim 22, wherein said instructing to increase the intensity of signals is such that the signal strength value of the targeted terminal apparatus is estimated from a value of correlation between the received response vector and the one of the virtual response vectors.